

inescapable in the television environment. The compression ratios involved in encoding high resolution video for terrestrial transmission reduce to fractional bits per displayable pixel and there is little margin for unruly and highly variable levels of source noise. It is a fundamental advantage of interlace scanning that it alleviates this situation and adds invaluable "overhead" to the robustness of the transmission. The practical implications of this were dramatically encountered during the ACATS/ATTC protracted testing process. When AT&T developed the encoder for the 1280 x 720 progressive format, it had considerable difficulty with the noise level of the progressive camera used. It ultimately produced a better 1280 x 720 progressive picture by conversion from the relatively noise-free 1920 x 1035 interlace camera images! The published specifications of the new Polaroid HDTV progressive camera clearly indicate this continuing and fundamental signal to noise disadvantage. Currently there is no way to circumvent this. Only steadfast painstaking technological developments will overcome this present limitation.

It is clear that significant misunderstandings still prevail among many in the computer industry regarding the uses and suitability of the different scanning methods. For example, Microsoft states "...interlaced scanning produces degraded images and a lower clarity for text and graphics than progressive scanning, which is currently used in computer monitors. The computer industry uses progressive scanning to insure that consumers will be able to read clearly and easily all text and graphics displayed on a monitor..."¹¹ This simple statement goes straight to the heart of the persistent

¹¹ Microsoft comments, p.7.

misunderstanding that sharply divides the computer and television industries. Video in the context of the computer industry is precisely this relatively narrow subset described by Microsoft, confined to the optimal transformation of computer digital data into highly legible analog portrayal of text and graphics on a computer monitor. The television system is a far different entity. It encompasses every conceivable facet of video, from its creation of live action and full motion in real-time by television cameras to the stringent challenges of the bandwidth-constricted system that follows. The cameras themselves encompass complexities dealing with interlace scanning that are unknown to those familiar with computer technology. This television system also includes the recording on tape, disk, or RAM of high digital data rates in real-time, and extends to all of the complexities of contemporary image manipulation, television routing and distribution, and associated networking and nonlinear servers for station play to air. Finally, the most challenging task of all: RF transmission through a highly constrictive and very hostile 6 MHz channel. There is simply no parallel between what DTV means to the computer monitor and what it means within a gigantic television complex. Within this television complex, program producers have become masters at creating and presenting text and graphics that are readily legible across a living room. At present they do it all the time the world over within an entirely interlaced environment. They will do it strikingly better with the higher resolution of HDTV.

Microsoft's misunderstanding of television persists throughout their comments. They criticize the 60 Hz picture display rate. They fail to understand that the ATSC DTV standard defines a television transmission standard and the 60 Hz maximum

transmission rate within that standard -- not a display refresh rate. The DTV receiver manufacturer is entirely free to make the native display refresh rate any number of frames/fields per second it deems desirable to appeal to different types of consumers.

The urging of a 72 Hz picture display rate by Microsoft based solely upon the existence of some 72 Hz computer monitors is disingenuous and ignores the stark fact that the computer industry conforms to no standard whatever for monitor display rates (as shown in our earlier table) in the marketplace today. As we stated in our comments, the computer industry should remain unfettered in their choice of tailoring a display monitor refresh rate to their diverse marketplace viewing requirements. But they must be realistic in what they advocate for a DTV television system.

In summary, the current technology obeys precisely predictable theoretical constraints. Interlace is a technical tool. In the case of an HDTV camera carefully designed within the limits of interlace scanning, it is clear that interlace scanning proves its worth in a considerable enhancement to sensitivity, allowing a higher spatial resolution within a defined bandwidth, and a lower cost. This is the central message -- one that is grounded in the technical reality of television broadcasting.

V. THE COMMISSION SHOULD MANDATE THE ATSC DTV STANDARD IN ITS ENTIRETY.

ACATS opponents have continued to focus on a seemingly endless search for a standard with exactly the right technical numbers. We pointed out in our initial comments, as did many other parties to this proceeding: the ATSC DTV standard is a compromise forged in a long proceeding and hammered out among vitally interested

inter-industry participants. Such technical discourse should have been over long ago. The work was done. The formats were all examined. The appropriate compromises were reached. A working system was built and exhaustively tested. It works and it works very well. No amount of tortuous twisting and turning in the form of submissions dense with questionable cost analyses can take away from the splendid work of ACATS and the Grand Alliance.

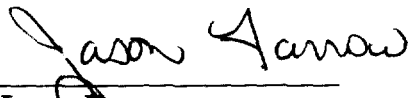
The success of DTV will now be determined by the confluence of six critical factors:

- A mandated standard: SEL reaffirms this as a must for the certainty required by all participants. Only a mandated standard will lead to:
- The commitment of content providers: crucial to the vigorous launch and ongoing momentum of hardware sales.
- Commitment of consumer electronics manufacturers: required to make the massive investment in the requisite VLSI.
- Commitment of broadcasters: who need a mandated standard and not the diversity of formats characteristic of the computer industry.
- Commitment of the professional equipment manufacturers: who need manufacturing economics of scale only a mandated standard can provide.
- Commitment of the consumer: which will only come if they are certain that the broadcasting environment is as predictable nationwide as it is today.

The ACATS standard in its entirety was designed to ensure the coming together of these factors. We urge the Commission to adopt the proposal contained in the Fifth Further Notice and mandate the entire ATSC DTV system.

Respectfully submitted,

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